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| 10/759,492 | 01/16/2004 | Edward Hosung Park | 03-0051 | 7681 |

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FREUDENBERG-NOK GENERAL PARTNERSHIP
LEGAL DEPARTMENT
47690 EAST ANCHOR COURT
PLYMOUTH, MI 48170-2455

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| EXAMINER |
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DANIELS, MATTHEW J

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| ART UNIT | PAPER NUMBER |
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1791

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02/20/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|---------------------------------------|--|--|
| Office Action Summary | Application No. 10/759,492 | Applicant(s) PARK, EDWARD HOSUNG | |
| | Examiner MATTHEW J. DANIELS | Art Unit 1791 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/24/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1, 4, 9-11, 13-16, 18, 19, 35, and 40** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 5910544) in view of McMahon (US 3432373). **As to Claims 1, 10, and 35**, Ozawa teaches dynamically vulcanizing (20:30-32) a mixture which may contain a fluoro-rubber (32:5-10), which is interpreted to be a fluoroelastomer, and a thermoplastic (19:45-20:9, 30:46-31:33) placed in a first port of a mixing machine (36:28-33), adding a curing agent (28:65) in a second downstream port (36:34-37) and mixing at a temperature above the melting point of the thermoplastic (20:43-45) for a time period which would form a partially cured thermoplastic vulcanizate (20:45-50, 1:38). Since the degree of vulcanization would be a result effective variable selected by the ordinary artisan (20:45-50), one would have found it obvious to optimize this quantity to arrive at the T90 or less through routine experimentation. The partially cured material is extruded from an extruder (26:47-54) and may be subsequently placed on a substrate with an adhesive (26:58-64) and fully cured (52:35-45).

It is unclear whether Ozawa expressly teaches to place the partially cured material on a substrate with an adhesive and subsequently fully cure. However, in view of Ozawa's teaching to separately perform each of these steps, it is submitted that it would have been obvious to

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combine them together into one process. As evidence or further teaching that it is obvious to do so, McMahon teaches applying partially cured rubber material (2:59-60) onto a substrate with an adhesive (3:1-2) and performing a final cure of the laminate (3:20-45).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of McMahon into that of Ozawa because (a) McMahon suggests the process for use with partially cured rubber, which is present in the Ozawa vulcanizate, or (b) Ozawa suggests each of the process steps demonstrated by McMahon, namely use of an adhesive on a substrate, application of an elastomeric or rubber material, and final curing.

As to Claim 4, Ozawa teaches that the substrate may comprise reinforcing fibers (21:65-22:3) such as polyamides, nylons, and polyesters, which are plastics. **As to Claims 9, 18, and 40**, Ozawa teaches a peroxide curing agent (28:65). **As to Claim 11**, it is generally obvious to make a batch process continuous, and particularly in the case where Ozawa uses a screw extruder, it would have been obvious to perform the process continuously. **As to Claim 13**, it is submitted that the particular crosslinking time disclosed by Ozawa (20:45-50) reads on the claimed invention, and in the alternative, it would have been obvious to optimize the curing time to arrive at the claimed condition. **As to Claims 14-16 and 41-43**, Ozawa teaches that in a dynamic mixing process, many thermoplastics may be used interchangeably, including fluoroplastics (23:47-49, ETFE), non-fluorinated (23:20-43), and partially fluorinated thermoplastics (PVDF, 23:44-45). **As to Claim 19**, Ozawa teaches placing an adhesive on a solid support, and the thermoplastic elastomer composition is placed onto the adhesive (26:58-

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64). Additionally or alternatively, McMahon suggests that these steps are conventional (2:59-60, 3:20-45).

2. **Claims 2, 3, 20, and 36** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 5910544) in view of McMahon (US 3432373), and further in view of Eisinga (US 5792348). Ozawa and McMahon teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claims 2, 3, 20, and 36**, Ozawa is silent to “insertion molding” onto a metal substrate. However, Eisinga teaches that it is known to insert mold onto a steel plate (2:8-17), which is a metal insert placed in a mold, reading on “insertion molding”. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Eisinga into that of Ozawa because (a) Ozawa suggests that the thermoplastic elastomer should be incorporated with other materials in a composite structure, and Eisinga provides one method for incorporating the materials of Ozawa into composite structures, or (b) Ozawa provides the PVDF material suggested by Eisinga.

3. **Claims 5-7, 21, and 37** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 5910544) in view of McMahon (US 3432373), and further in view of DeAntonis (EP 0132583 A2). Ozawa and McMahon teach the subject matter of Claim 1, 10, and 35 above under 35 USC 103(a). **As to Claims 5-7, 21, and 37**, Ozawa suggests extrusion of a mixture that is interpreted to be at least partially cured, but Ozawa does not specifically teach “co-extrusion” of the adhesive and the partially cured thermoplastic vulcanizate by a liquid continuous injection

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unit. However, DeAntonis teaches applying and bringing layers together by co-extrusion of a plastic material, adhesive, and substrate (page 4). Although the device is not specifically described as a “liquid continuous injection unit”, it is submitted that because the layers are “molten” (page 4, line 31) and may be cast onto rolls (page 15, line 35), that the device of DeAntonis is a liquid continuous injection unit. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of DeAntonis into that of Ozawa because (a) Ozawa suggests extrusion of polyvinylidene fluoride, which is provided by DeAntonis, and (b) incorporating the substrate of DeAntonis would maintain the excellent chemical resistance of the fluoropolymer but allow minimization of the amount of fluoropolymer used by providing only a surface layer (page 3, top half).

4. **Claims 8, 17, and 39** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 5910544) in view of McMahon (US 3432373), and further in view of Kolb (USPN 3884877). Ozawa and McMahon teach the subject matter of Claim 1, 10, and 35 above under 35 USC 103(a). **As to Claim 8, 17, and 39**, Ozawa is silent to the bisphenol curing agents. However, Kolb teaches that when curing fluoroelastomers (title) of vinylidene fluoride (4:55-56), it is known to use a bisphenol curative (8:63-69, 8:37-50). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kolb into that of Ozawa because (a) Ozawa suggests that a curing agent is needed, and Kolb teaches that bisphenols are very useful (8:69) for curing fluoroelastomer compositions (title), particularly vinylidene fluoride (4:55-56), or (b) doing so would provide the ability to vary the curing time and temperature (9:22-25).

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5. **Claims 12 and 38** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 5910544) in view of McMahon (US 3432373), and further in view of Yokokawa (USPN 4094949). Ozawa and McMahon teach the subject matter of Claim 1, 10, and 35 above under 35 USC 103(a). **As to Claims 12 and 38**, Ozawa appears to be silent to the claimed copolymer, however, Yokokawa teaches copolymers of vinylidene fluoride (2:25-35, 4:41). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Yokokawa into that of Ozawa because one of ordinary skill in the art would have viewed the materials disclosed in the similar method of Yokokawa as substitutable alternatives for those already disclosed by Ozawa.

6. **Claims 22-25, 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 5910544) in view of DeAntonis (EP 0132583 A2) and McMahon (US 3432373). **As to Claim 22**, Ozawa teaches dynamically vulcanizing (20:30-32) a mixture which may contain a fluoro-rubber (32:5-10), which is interpreted to be a fluoroelastomer, and a thermoplastic (19:45-20:9, 30:46-31:33) placed in a first port of a mixing machine (36:28-33), adding a curing agent (28:65) in a second downstream port (36:34-37) and mixing at a temperature above the melting point of the thermoplastic (20:43-45) for a time period which would form a partially cured thermoplastic vulcanizate (20:45-50, 1:38). Since the degree of vulcanization would be a result effective variable selected by the ordinary artisan (20:45-50), one would have found it obvious to optimize this quantity to arrive at the T90 or less through routine experimentation. The partially

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cured material is extruded from an extruder (26:47-54) and may be subsequently placed on a substrate with an adhesive (26:58-64) and fully cured (52:35-45).

Ozawa is silent to the coextrusion of the partially cured vulcanizate with a substrate and it is unclear whether Ozawa expressly teaches to place the partially cured material on a substrate with an adhesive and subsequently fully cure. However, these aspects of the invention would have been obvious for the following reasons:

DeAntonis teaches applying a thermoplastic material onto a substrate by co-extrusion (page 4) and McMahon teaches applying partially cured rubber material (2:59-60) onto a substrate with an adhesive (3:1-2) and performing a final cure of the laminate (3:20-45).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of DeAntonis and McMahon into that of Ozawa because (a) McMahon suggests the process for use with partially cured rubber, which is present in the Ozawa vulcanizate, or (b) Ozawa suggests each of the process steps demonstrated by McMahon, namely use of an adhesive on a substrate, application of an elastomeric or rubber material, and final curing, and (c) Ozawa suggests extrusion of the material and incorporation with a substrate, and coextrusion would have been an obvious alternative process known to the ordinary artisan for achieving this objective.

As to Claim 23, DeAntonis provides a co-extruded adhesive layer between the two materials (page 4), and one would be motivated to incorporate the adhesive in order to improve the bond between the materials. **As to Claim 24**, DeAntonis teaches a multimanifold dies (page 4, line 22) which would inject the molten material in a liquid phase. **As to Claim 25**, it is submitted that it would have been obvious over the method of Ozawa to perform the process of

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Claim 22 in a twin screw extruder (36:43, for example). **As to Claim 28**, Ozawa teaches peroxides (28:65).

7. **Claim 26** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 5910544) in view of McMahon (US 3432373), DeAntonis (EP 0132583 A2), and further in view of Yokokawa (USPN 4094949). Ozawa, McMahon, and DeAntonis teach the subject matter of Claims 22 and 25 above under 35 USC 103(a). **As to Claim 26**, Ozawa appears to be silent to the claimed copolymer, however, Yokokawa teaches copolymers of vinylidene fluoride (2:25-35, 4:41). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Yokokawa into that of Ozawa because one of ordinary skill in the art would have viewed the materials disclosed in the similar method of Yokokawa as substitutable alternatives for those already disclosed by Ozawa.

8. **Claim 27** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (USPN 5910544) in view of McMahon (US 3432373), DeAntonis (EP 0132583 A2), and further in view of Kolb (USPN 3884877). Ozawa, McMahon, and DeAntonis teach the subject matter of Claims 22 and 25 above under 35 USC 103(a). **As to Claim 27**, Ozawa is silent to the bisphenol curing agents. However, Kolb teaches that when curing fluoroelastomers (title) of vinylidene fluoride (4:55-56), it is known to use a bisphenol curative (8:63-69, 8:37-50). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kolb into that of Ozawa because (a) Ozawa teaches peroxide curing agents and fluororubbers, and Kolb teaches that bisphenols are very useful (8:69) for curing fluoroelastomer

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compositions (title), particularly vinylidene fluoride (4:55-56), therefore Kolb teaches a substitutable curing agent for the materials of Ozawa, or (b) doing so would provide the ability to vary the curing time and temperature (9:22-25).

9. **Claims 29-31 and 34** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (USPN 5910544) in view of McMahon (US 3432373) and Eisinga (USPN 5792348). **As to Claim 29**, Ozawa teaches dynamically vulcanizing (20:30-32) a mixture which may contain a fluoro-rubber (32:5-10), which is interpreted to be a fluoroelastomer, and a thermoplastic (19:45-20:9, 30:46-31:33) which may be polyvinylidene fluoride (20:7) placed in a first port of a mixing machine (36:28-33), adding a curing agent (28:65) in a second downstream port (36:34-37) and mixing at a temperature above the melting point of the thermoplastic (20:43-45) for a time period which would form a partially cured thermoplastic vulcanizate (20:45-50, 1:38). Since the degree of vulcanization would be a result effective variable selected by the ordinary artisan (20:45-50), one would have found it obvious to optimize this quantity to arrive at the T90 or less through routine experimentation. The partially cured material is extruded from an extruder (26:47-54) and may be subsequently placed on a substrate with an adhesive (26:58-64) and fully cured (52:35-45).

Ozawa is silent to the insert molding onto an adhesive coated substrate and it is unclear whether Ozawa expressly teaches to place the partially cured material on a substrate with an adhesive and subsequently fully cure. However, these aspects of the invention would have been obvious for the following reasons:

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McMahon teaches applying partially cured rubber material (2:59-60) onto a substrate with an adhesive (3:1-2) and performing a final cure of the laminate (3:20-45). Although McMahon is also silent to an insert molding process, Eisinga further teaches that it is conventional to injection molding onto an insert (2:12-17), which is interpreted to be insertion molding.

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of Eisinga and McMahon into that of Ozawa because (a) McMahon suggests the process for use with partially cured rubber, which is present in the Ozawa vulcanizate, or (b) Ozawa suggests the process steps demonstrated by McMahon, namely use of an adhesive on a substrate, application of an elastomeric or rubber material, and final curing, and (c) Ozawa suggests to mold the material in the same way that thermoplastics are normally molded (16:57-65), which would obviously include injection molding, which is provided by Eisinga.

As to Claims 30, 31, and 34, Ozawa teaches or suggests a fluoroplastic polyvinylidene fluoride (20:7), a twin screw for mixing (36:43, for example), and Ozawa teaches peroxide curing agents (28:65).

10. **Claim 32** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (US 5910544) in view of McMahon (US 3432373), Eisinga (USPN 5792348), and further in view of Yokokawa (USPN 4094949). Ozawa, McMahon, and Eisinga teach the subject matter of Claim 29 above under 35 USC 103(a). **As to Claim 32**, Ozawa appears to be silent to the claimed copolymer, however, Yokokawa teaches copolymers of vinylidene fluoride (2:25-35, 4:41). It

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would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Yokokawa into that of Ozawa because one of ordinary skill in the art would have viewed the materials disclosed in the similar method of Yokokawa as substitutable alternatives for those already disclosed by Ozawa.

11. **Claim 33** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa (USPN 5910544) in view of McMahon (US 3432373), Eisinga (USPN 5792348), and further in view of Kolb (USPN 3884877). Ozawa, McMahon, and Eisinga teach the subject matter of Claim 29 above under 35 USC 103(a). **As to Claim 27**, Ozawa is silent to the bisphenol curing agents. However, Kolb teaches that when curing fluoroelastomers (title) of vinylidene fluoride (4:55-56), it is known to use a bisphenol curative (8:63-69, 8:37-50). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Kolb into that of Ozawa because (a) Ozawa teaches peroxide curing agents and fluororubbers, and Kolb teaches that bisphenols are very useful (8:69) for curing fluoroelastomer compositions (title), particularly vinylidene fluoride (4:55-56), therefore Kolb teaches a substitutable curing agent for the materials of Ozawa, or (b) doing so would provide the ability to vary the curing time and temperature (9:22-25).

Response to Arguments

12. Applicant's arguments filed 5 May 2008 have been fully considered but they are not persuasive. The arguments appear to be on the following grounds:

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(a) Column 26 of the Ozawa reference does not disclose any step of completing the cure of an elastomer composition while in contact with an adhesive or other substrate. Column 26, line 65 to column 27, line 12 teach that there is no vulcanization process. The passage even explains the advantages of making the hose without vulcanization in that there is no compression deformation caused by the heat during vulcanization. Ozawa does not teach to place a partially cured material into contact with a substrate or adhesive and to subsequently fully cure it. Ozawa teaches the advantages of avoiding the subsequent step of avoiding the final curing step, and any motivation to modify the reference in the manner suggested by the rejection is based on hindsight.

(b) Eisinga, DeAntonis, Kolb, Yokokawa do not cure the deficiencies of Ozawa.

13. These arguments are not persuasive for the following reasons:

(a) Applicant's remarks are noted, but do not address column 52 of the Ozawa reference. The reference is prior art for all that it teaches, including non-preferred embodiments. In this case, column 26 must be read as a part of the reference as a whole. While column 26 suggests that no vulcanization process is required, one of ordinary skill in the art at the time of the invention also having knowledge of column 52 (teaching that a vulcanization process can be performed) would not have looked upon a vulcanization process as *unobvious*.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the

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time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In this case, when determining what was within the level of ordinary skill at the time the invention was made, the whole reference must be considered.

Applicant's interpretation of the reference is equally subject to hindsight reasoning in that it urges one to consider one example from the reference in isolation without considering column 52 for equally pertinent teachings. While column 26 suggests that a vulcanization process is not required, the additional teaching in the reference that a similar hose can be vulcanized does not point towards unobviousness of the vulcanization process in combination with the other conventional steps.

(b) Rejections of the dependent claims are maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. DANIELS whose telephone number is (571)272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew J. Daniels/
Primary Examiner, Art Unit 1791
2/16/09